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FORMERLY
AMERICAN GAS LIGHT JOURNAL

VOL. CXIII., No. 11
WHOLE No. 3262

NEW YORK, SATURDAY, SEPTEMBER 11, 1920

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The Subordinate's Measure of His "Boss"

"Don't Watch the Clock" Adage Loses Its Meaning When Employer Himself Shows Such Slight Respect for Working Hours as Stretching a Fifteen-Minute Conference Into a Test of Endurance by Anecdote and Personal Reminiscence

By H. M. RILEY

Some twenty-five years ago, on going into the office of 'most any business house one was very likely to have his attention attracted to, and often, at the same time, distracted by certain prominently located placards admonishing the reader that the wheels of industry, at least in this particular place, were lubricated and directed by certain well-defined rules or commandments. Most of us are fulsomely familiar with the contents of these compressed, predigested sermons in black and white, the favorite texts being somewhat along the following lines: "Don't watch the clock," or "More work, more pay," or still, "Strive and succeed."

Indeed, paralleling the much hackneyed adage concerning the sun and something new, these sign posts, charting out the straight and narrow of commercial life for the business prodigal and him of industrious hobits, have been handed down to the present day, and though clothed in entirely different habiliment, still breathe a brimstone and fire warning to the wayward and a promise of a season of harp picking to the faithful.

The "How to Succeed" in Abundant Volume

Vast and compendious is the literature now on the market revealing the philosopher's stone which will loose-leaf the youthful aspirant to business success, nevertheless, with Swedenborgian effect, he is warned therein of the results and fruits of such transgressions as too much attention to his wrist watch and the like.

The writer has often speculated as to whether the aforementioned sermons in ink and cardboard and the subsequent voluminous brochures, ramifying without end on the success to be attained via what might be termed the push button route, were not the innocent progenitors of the modern efficiency man.

Understand me, I do not mean to speak disparagingly of the bright business luminaries who have concentrated their secrets of success into a few pithy office-boy-galling remarks, for without question they successfully served some very useful ends.

The art of printing was encouraged, the business man who had arrived became surrounded with a certain veneer or halo, and it afforded the father, figuratively speaking, a lash for speeding along the son who was tackling his first job; fitting him, in a word, to arrive regardless of terminal facilities.

I repeat, on a basis of good intentions the business men were quite efficient pavers.

Obviously these beacon lights of business progress, and I include the latter day epistles and epigrammatic editorials, were for the almost exclusive consumption of the young man launched into the maelstrom of industry and cheerfully seeking to warp into the dock of affluence and success. But once the hawser was made fast to the wharf these peccadilloes had of necessity to be relegated to the realm of ancient history, consigned to the tool room, so to say, where they invariably assumed gigantic proportions and were to be drawn out at certain seasons and wielded with considerable eclat by the skipper, who, in some fashion or other, whether by design or accident, had made port.

In a word, the successful business man had taken upon himself the desired or rather required waxing down finish and the priming coat period and axiomatic days of business epigram consumption were past.

They were useful adjuncts, of course, these epigrams, but were to be now viewed in a different light—much the same as the contrasting effects produced when one looks through a microscope, provided, of course, he uses both ends as the eyepiece.

Viewpoint of the Understrapper as to the Boss

However, in the meantime, what has the lucky or luckless youth who has been on the receiving end of the sermons been thinking, whether he be on the mourner's bench or in the gallery philosophizing with the janitor?

What ideas of primal instinct have been assiduously gnarling and wrinkling his very receptive brain?

Has he not attempted to improvise some mental yardstick to be used in "getting a line on the boss" as one might put it?

I will make a reservation in the above query by assuming the young hopeful is of the type that has wrestled manfully and with the proper mental attitude with the well-meant mottos and tried to stomach the medicine with nonchalant abandon and a minimum of disquietude such as displayed by the early Christian martyrs.

Yes, we can vouch with almost mathematical certainty that the embryonic captain of industry has been doing a bit of intensive thinking on his own account and has ofttimes evolved a surprisingly accurate estimate of the boss, constructing a system of philosophy in this regard that might well cause the latter to think seriously of charging off the contents of the storeroom previously mentioned as being archaic and worthless.

He has, in other words, been engaging in a bit of priming work in the reverse direction—he has been playing blacksmith, forging on the anvil of common sense a few tools with handles rather ingeniously fashioned to key in with the peculiar anatomy of his own brain.

Secretly or clandestinely he has forsworn the expense of printing and with one relatively agile leap has mounted the rostrum.

In short, he has analyzed with surprising accuracy his superior's method of handling his business and has rigorously calibrated by means of the rock-ribbed laws of cause and effect the boss' merits and shortcomings.

Does the ambitious youngster in business resent being asked to put in some extra time at work during the peak season or on special occasions? Not at all—he early realizes that this is a part of the game, and he soon curbs any normal aversion to working at overload capacity. And to eschew overtime work is normal, all philosophizing to the contrary notwithstanding.

Does he make more or less strenuous efforts to like his work over and above any financial aspects of the situation? He does. More than that, he considers his particular line of work as being the one most essential to human progress, be he skillfully juggling griddle cakes in the cafeteria window or counting money in the teller's cage.

Does he have vision and imagination that will act as an accelerator in his pull to the top? Beyond a doubt, since these attributes are instinctive from earliest childhood days. Witness the Santa Claus swindle and the myriad blasted presidential hopes.

And so other requirements and qualifications can be dismissed via the argumentative route.

At this point I can fancy many of my readers speculating that the Lochinvar in question must of necessity have formed no mental yardstick for cataloguing anything detrimental to the boss. This, of course, being based on the premise that the time-honored prescriptions have been swallowed with alacrity and a certain degree of fervor. Or, in other words, if we can stamp the subject as being a "glutton for punishment" there is no use proceeding with this discourse, there being neither time nor inclination for the employee to even attempt to pry loose the "veneer arrive."

But hold—the sleeve of this article holds something more scenic than a soiled cuff. Remember that the right shoe will not ordinarily fit the left foot.

Let us take a glance then into this Pandorean beaker and examine some of the strata contained therein.

First of all there is the matter of the employer attempting to regulate the morals of the underling during off business hours, and though well meant, nevertheless, like the bar-room brawl, it takes in too much territory. Included within its very indefinite and indistinct boundaries might be included smoking, particularly cigarettes.

The writer recollects one successful skipper who, like the aeronaut en route for the moon, would cut all his weights upon seeing one of his men smoking a cigarette. Verily with him such a happening was about as popular as the finding of a pair of dental forceps in a ten-year old's stocking on Christmas.

Then there are dancing, card playing, a trip now and then to the race track, an evening with the silent drama, and the residue of the "seven deadly sins" in the eyes of the regulator of the employee's off-hour morals. Mark you, the executive who indulges in this petty practice of what he erroneously considers sky-piloting speedily alienates himself from the good will of his employees; a not too healthy state of business affairs. Various people have various ways of seeking amusement, and so long as the employee delivers the goods while on the job and has a reputation as a decent citizen in the community, we cannot ask for more without becoming childishly obnoxious. At all events, the matter automatically takes care of itself in nearly all cases. That is, when one's outside habits tend to overstep the bounds of decency his daily work is affected and he quickly eliminates himself as a member of his particular organization.

Employer's Own Peculiar Transgressions on Time

Another ingredient has to do with the high abandon with which the executive is often wont to get a strangle hold on Old Father Time through the medium of indulging in anecdotes and personal reminiscences with his subordinates—that is, during business hours. It is rather mystifying to note the manner in which the boss, with his well-groomed ideas of efficiency, will call in one of his employees for a fifteen minutes' business conference and then at the conclusion of the same proceed to fritter away the balance of the hour relating some personal triviality. The employee, generally speaking, is not particularly interested in the fact that his superior's wife's aunt has a harelip, or that he wears policemen's and letter carriers' suspenders. Not at all—he is on the job to work and, contrary to the generally accepted idea, this form of time-killing acts on him much like an anaesthetic. Let it be said that this practice is a great promoter of demoralization and, after all is said and done, passing an evening ensconced in the fourth row center provides considerably more nourishment in the way of entertainment.

Speaking of nourishment, can any one tell me why some employers, on going to lunch with their subordinates, will persist in talking shop during the whole of the gastronomic interval. The answer might lie in the assumption that those who make their daily work a hobby are the most given to this practice. And we weep for those narrow gauge apostles of business success who liken their daily routine of living to the voids in a well-packed can of sardines.

Those Glittering Prospects

And now as to still another mark on the yardstick. When it comes to making flattering promises—of course properly camouflaged, but promises, nevertheless—and painting futuristic pictures concerning how far along the line one will be at some future time, I must admit that I have run across several bell cows who could make a Ouija Board and all the ancient and modern artists rolled into one look like a moth-eaten parachute in a transatlantic air race. Do not be deluded; the modern energetic youth has an uncanny faculty of seeing through these artifices, if such they be, and without waste of words or much cogitation brands such like as

"Old Stuff." Recognize the fact that when it comes to spotting "Old Stuff" the aforementioned youth is "there" like the cornerstone of the great pyramid. At the same time he is mighty apt to look with suspicion on this practice much along the same line that the staid investor would view a new proposition presented to him as being a sure 100 per cent profit yielder. This figure of 100 per cent, by the way, might possibly be a laughably low one during the present regime of old H. C. L. The writer would admonish executives in general to "lay off" of this practice though it enables one to exercise his oratorical ability "jamming wind" it does not mean anything. The only type of employee who guzzles in this "guff" is of the class that you do not want around in any event, and a lavish expenditure of the same might cause the desirable fellow to emulate the old cow who had been kept too long on a former sheep pasture. The same, so it is told, jumped the fence and looked for new grazing land.

The close inspection of still another stratum discloses an attribute which had its conception at the very dawn of history and has survived to this day, in a limited way it is true, but I repeat it still has a barb sufficiently sharp to get under the hide of a saint. The writer refers to the habit that some executives have of always regarding their employees with a kind of fatherly attitude; always feeling that their subordinates are still in the primary class regardless of their success and achievements. With the air and self-inflicted responsibility of a patriarch they will rant ad infinitum on the way they did things when they were in the making and with an air of supersadness will bewail that those halcyon days of common sense in youth are past. In their mind they "stand like druids of eld"—"the last of the Mohicans." Oh, they do not hate themselves on this score, rest assured as to that. Their physiques are prematurely hastened toward a state of round shoulderness from the weight of self-donated medals.

Do not shackle the energetic young employee with old fogy paternalism. Energy and achievement are stultified in all directions when you ration out authority to him with a string tied to it. So many young men are given tasks to accomplish requiring the exercise of a certain amount of authority and at the very start any originality and initiative are lassoed and held captive by a lot of useless directions. If this tendency is not eliminated one is on the high road of surrounding himself with an organization of manikins and the organzatoin eventually has about as much soul as a typewriter in a junk shop. Heaven knows there are enough pitfalls and obstacles in the way to success without having to stand periodic showers of cold water with some one else controlling the faucet. A chestnut burr in the seat of a bicyclist's pants is about as comfortable as the most of the paternalistic drivel referred to.

And so the writer might describe and elucidate many other shortcomings which tend to make the youthful aspirant feel that he is running the gantlet and that after all "the game is hardly worth the candle."

In justice to all concerned, let it be averred that the ambitious employee has a fairly clear and concise idea as to what is expected of him and generally speaking, given good home training, is willing to stand or fall on the basis of hard work, enthusiasm, education, loyalty, and the like. Furthermore, he will take his legitimate medicine when it is due with Spartan-like courage and be the better man for its wholesome effect.

Therefore it behooves the executive to take a mental inventory now and then and at least make a manful effort to slag off with the flux of common sense any gangue that will tend to constrict honest endeavor on the part of the employee, and to present an attitude of strong sympathy and helpfulness that will stand the most rigorous acid test.

Do not attempt to mold the future bosses with a hand encrusted and barnacled with petty foibles and personal peculiarities for you might unwittingly be hoisted with your own petard. The young man of to-day striving toward success demands the help and encouragement that has placed our country at the top of the world's industrial advancement and he's going to get it if he's worth his salt.

At that we must concede that De Coverly was no "piker" in the very day philosophy of life when he said that "much might be said on both sides."

Gas Works Expedients

The maintenance of a continuous supply of gas to the consumers at all hours of the day or night, throughout every day in the year, is the consideration which perhaps above all others, is deemed the most important in the conduct of the artificial gas industry.

There is no other question which will cause the man in charge more anxiety, nor which will call forth greater exertions, than the prospect of an interruption in the continuity of supply to the district under his supervision.

Gas works, as in most general use, are designed and operated with the view to manufacturing and storing during twenty-four hours a quantity of gas, the bulk of which will be consumed in six or eight hours, and there will usually be in this consumption period a peak load demand that for a short time, will far exceed the maximum producing capacity.

Under such operating conditions there may at times be cause for apprehension in any plant.

In the larger cities having gas manufacturing systems composed of a multiplicity of units, or as in some instances two or more complete generating stations, the probability of a total interruption in the service might only be looked for in the event of a disaster or a shortage in the delivery of raw materials.

The smaller town, however, is not infrequently provided with but one set of apparatus, which oftentimes is operated to full capacity if it is not made up of some elements which have passed the limit of usefulness. Or it may be that sufficient funds are not available to provide necessary repairs and renewals, or the plant may be located in a district where supplies are not easily obtained and where there may not be even a machine shop on which to rely in case of trouble.

Under these circumstances there will be occasions in the gas man's experience that will call for some rapid thinking and the exercise of a considerable measure of resourcefulness to help him out of the difficulties that are sure to present themselves.

In the hope that a recital of the methods adopted by some of our fellow workers in times of stress might be of service to the members of this association, this paper has been prepared, declared R. A. Wallace, superintendent, gas department, Quebec Railway, Light & Power Company, at the Canadian Gas Association convention The writer is indebted to other members of the gas fraternity for contributions, and for conveniences of reference, instances have been numbered under the name of "expedients."

Expedient No. 1

With the collapse of the storage holder (250,000 cu. ft.) in a manufacturing city of 15,000 population, the problem was how to quickly restore and maintain the service.

The gas manufacturing plant consisted of two water gas generating sets of a nominal capacity of 175,000 cu. ft. per day each—a 25,000 cu. ft. relief holder, two exhausters rated as of 8,000 cu. ft. per hour capacity each and a washer, set of purifiers and station meter, the three latter being of more than ample size for the then daily requirements.

The gas was generated through the scrubbers, condensers and tar extractors into the relief holder. No provision had been made for using the relief as a storage holder for purified gas, nor was there a by-pass connection to the exhausters. The maximum hourly peak load demand had at times exceeded 20,00 cu. ft.

To meet the situation, a 3-in. pipe with a globe valve was made to connect the inlet and outlet pipes of the exhausters, and a recording gauge, located in a convenient place for observation, was attached on the pressure or outlet side. The inlet and outlet valves to the washer, station meter, storage holder and governor were closed and the by-pass valves opened. The purifying material was made lighter to reduce back pressure.

Both generating sets were kept under fire and put in action whenever the demand for gas caused a heavy pull on the relief holder, which was kept as full as possible. The gas was pumped by the exhausters from the relief holder and forced through the purifiers direct into the distribution system, both exhausters being in action at the same time.

A satisfactory pressure on the mains was determined by a study of the record of two pressure gauges, one located at the outlet of the exhausters and the other at a point some distance from the works. An excess pressure by the exhausters on the street mains was prevented by opening the valve in the 3-in. pipe and allowing a part of the gas to return to the inlet side. In this way the town was supplied with gas for eight weeks while the storage holder was being repaired.

Expedient No. 2

An explosion wrecked the building in which was housed the exhausters, tar extractor, purifiers and station meter of a carburetted water gas plant, and damaged, more or less seriously, all the pieces of apparatus with the exception of one purifier. The gas connections throughout were practically uninjured, but the steam pipes to the exhausters and to heat the building were put entirely out of commission. The accident happened in the early part of the winter season, and there was sharp frost. Generators, boilers and holders were intact.

The storage and relief holders, which at that time were large enough to maintain a supply to the district for 36 hours were both almost fully inflated at the time of the explosion. No gas was lost. It was possible to maintain a fair pressure of gas on the distribution system from relief holder during the hours of light consumption, the gas being passed under holder pressure through the one purifier to the district.

While arranging to get one exhauster back in service, the stock of gas in the storage holder was held in reserve for peak load periods (about 6 hours each day), at other times the supply was kept up by generating into relief holder and supplying the street mains from it through the purifier as already indicated.

In this way the service to the town was maintained for forty-eight hours, by which time, one of the exhausters had been fitted up with a belted drive from an electric motor, and gas was sent out from storage holder as before the accident. Manufacturing operations were continued several days with a partially crippled exhauster and one purifier.

To continue operations through the winter, when the temperature would drop to several degrees below zero, temporary wooden structures covered with tar felt were constructed over the exhausters, and the renewed steam supply pipes were covered with non conducting material. Two purifiers were fitted with steam heating coils and put into commission. To extend the time necessary for changing material in the boxes, partial revivification in situ was provided for by admitting air at inlet of exhauster through a water seal and meter. The tar extractor and station meter were not put into use until the building was reconstructed.

The purifiers and their connections were exposed to winter temperatures for fourteen weeks and rebuilding operations carried on around the apparatus without any interruption in the supply of gas to the consumers.

Expedient No. 3

To keep a set of 12x12x3½ ft. water luted purifying boxes in use when the cover sides were leaking badly at the water line, the lutes were filled with "blue clay puddle" covering the holes where the aprons were badly corroded.

Expedient No. 4

Forty feet of galvanized sheet iron connections, 10-in. diameter, were used to put two of a set of four 20x20x6 ft. purifiers into action, pending the completion of the set and their 16-in. pipes and valves. The temporary connections were kept in use passing gas from high sulphur content coal for a period of five weeks.

Expedient No. 5

When corrosion caused a leak in the angle where the base plate joined the sides of a water gas generator, allowing steam to leak through during an up run, and gas to escape on a down run, a covering of a mixture of Portland cement and fire clay made a satisfactory repair, which held tight for more than two years.

Expedient No. 6

An unexpected increase in the demand for gas from a small coal gas works operating a single bench of three retorts temporarily overtaxed the combined storage and producing capacity. To save the situation a number of pieces of 2-in. pipe, four feet long, were cut and welded up at one end. These were then filled with coal oil and the other end lightly plugged with wet clay. When the charge of coal was burnt off, the retort lids were opened, the oil filled pipes pushed in on the hot coke, and the lids quickly closed. The exhauster was speeded up to increase the pull on the retorts, in this way the supply to the district was maintained, although the output on that occasion was more than double that ordinarily required.

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EXPEDIENT No. 7

During the recent shortage of oil, when the stock of oil in a 12-ft. diameter storage tank had been brought below the top of the pump suction pipe, which was located six inches above the bottom of the tank, the level of the oil was raised by pumping in light water gas tar; in this way the set was kept in operation several hours.

EXPEDIENT No. 7A

On another similar occasion refined petroleum was used for carburetting water gas.

EXPEDIENT No. 8

When the smokestack on a 100-H.P. boiler was blown down in a severe wind storm, a short temporary stack at the base of which a steam jet was placed, kept things going until the damage had been made good.

EXPEDIENT No. 9

When a burst tube in a 50-H.P. boiler, the only one on the works, caused a temporary shut down, two threshing machine boilers placed in the yard, from which steam pipes were carried through a broken pane of glass, and connected above the works boiler, prevented an interruption in the supply of gas to the district.

EXPEDIENT No. 10

A reduction in the water supply to a city caused by a serious break in the main water pipe, which required several days' time to repair, left the gas works without sufficient water to feed the boilers during the day time. A steam pump was hastily set up near a storage holder tank and water from the tank pumped to the boiler-feed tank through a duplicate steam pipe which had been laid underground between the boiler house and the gas holders. The water from the gas holder was made to pass through a home-made filter, a wooden box lined with hair felt and filled with washed coke.

EXPEDIENT No. 11

A leak from a broken water service near the crest of a hill and under the surface of an asphalt paved street, washed the supporting earth from under a 4-in. gas main, causing it to settle and fracture. The water did not show on the surface, nor was there any smell of escaping gas. The first sign of trouble came when the gas consumers living at the foot of the street reported that water was coming through the burners of the gas stoves which were in use in basement kitchens.

At the time frost had already entered the ground to a depth of two feet. When it was seen that it required constant pumping to keep the gas pipes free of water, and that it might take several days to find and stop the cause of trouble, the suction pipe of a drip, which was located some distance lower than the lowest service, was extended to a gulley well near by, covered with stable manure to prevent freezing, and the water allowed to overflow from the drip in a continuous stream, thus keeping the services free of water until the break was located at a distance of 1,800 ft. from where the trouble was first reported.

EXPEDIENT No. 12

The dragging anchor of a passing barge carried away an 8-in. submarine gas main laid in a tidal river to supply a suburb. A temporary 2-in. line was laid in the bed of the river at low tide, and a small electric-driven blower borrowed for the emergency from an industrial establishment, was connected to the pipe on the city end. By operating the blower at high speed during the time of peak load, a satisfactory service was maintained for several days.

EXPEDIENT No. 13

A leak of water into the inlet pipe of a single-lift holder was indicated by the necessity of frequent pumping of the drip. Although in the construction of the gas holder tank (which was of brick and cement) a dry well had been provided to accommodate the connections and valves. For some reason both inlet and outlet vertical pipes were partially embedded in the tank wall. A leak also existed in the tank wall where the pipes passed through, allowing water to fill the well.

To determine if the leak into the inlet pipe was from outside of the tank or not, the drip was flooded, the inlet valve closed and the flange removed from the top of the vertical pipe.

By using an electric light inside the pipe a trickle of water was noticed from a crack just below the flange of the tee connecting the horizontal with the vertical pipe, about five feet below the top of the wall.

To put a band round the defective tee on the outside or to replace it with another would have necessitated cutting into the tank wall, a risky undertaking. As the pipe, a ten-inch one, was fairly smooth and even on the inside, a block of wood about two and a half feet long, was turned so as to fit tight within the pipe, the center of the block being bored out to allow the pump suction pipe to pass through it, and to give as long a bearing as possible without obstructing the passage, the bottom end of the wood was cut diagonally opposite the tee branch.

The outside of the block was smeared with thick red lead paint and it was driven carefully down into the pipe opposite the crack.

The leak was stopped and the pipe so repaired has continued in commission several years.

EXPEDIENT No. 14

The inlet pipe to the single gas holder in a small coal gas works had become so obstructed with naphthalene deposits as to seriously increase the back pressure on the system and render it difficult to maintain the water seals at the purifiers.

As the usual recourse of steaming from the outside did not remedy the trouble, it was decided that the obstruction had formed in the vertical pipe within the tank.

Those of you, who have had experience, know that naphthalene does not so readily respond to a second steaming process.

To remove the obstruction, a hole for 1-in. pipe was tapped in the manhole cover plate on the holder crown opposite the inlet pipe. A ½-in. hose was then inserted through the hole into the vertical pipe, leaving a sufficient length of hose inside the holder to pass up and down with holder bell. A quantity of gas oil was then pumped into the pipe through the hose, steam was ap-

plied and naphthalene dissolved, and pumped out. The outlet pipe was used as inlet and outlet during the operation.

To increase gas-making capacity, R. C. Congdon, manager of the gas department of the Georgia Gas & Electric Company, converted an old condenser into a water gas generator which was set up in the works yard.

These are but a few instances of measures that have been taken to help out difficult problems on short notice. No doubt there are many other similar experiences which might be related at this meeting.

For those who may be interested I have appended a short list of other cases of which we have record in publications relating to gas manufacture and distribution.

Supplying gas without a holder—C. H. Nettleton. Proceedings American Gas Light Association, Vol. IV, page 108, *American Gas Light Journal,* issued December 2, 1879, page 244.

At the same meeting of the American Gas Light Association, reference was made to a gas holder made of wood, covered with tin plate and floated in the river, to keep up a supply to consumers, by M. W. Cartwright, Oswego, N. Y.

Moving large mains in service—*American Gas Light Journal,* issue of May 8, 1899, page 682.

Describes the methods adopted by the water and gas companies in Philadelphia, to maintain water and gas services during subway work, by a railroad company.

Gas distribution work at Leeds, England.—Here is given a description of special forms of wrought-steel mains. *Gas World,* January, 1902. *American Gas Light Journal,* February 3, 1902, page 154.

Odd gas holder experiences.—By E. M. Osbourne, *Progressive Age,* September 1, 1910, page 766.

Repairing broken retort standpipes.—By S. E. Defrese, *Progressive Age,* March 15, 1911, page 231.

Adding holder section while operating.—W. D. Birbeck, *Gas Age,* January 10, 1920, page 18.

Repairing a broken 36-in. pipe beneath a holder tank. —W. N. Tolman, proceedings American Gas Light Association, Vol. 17, page 193.

Carrying large distribution mains across subway excavation.—Proceedings American Gas Institute. Vol. VIII, part 2.

Apparatus for making 24-in. connections in a 30-in. cross without shutting off the gas.—Walton Forestall, Proceedings American Gas Light Association. Vol. XV, appendix.

Method of repairing break in a 24-in. holder outlet. —A. H. Strecker, engineer Public Service Company, Newark, N. J. Proceedings American Gas Institute. Vol. V, page 155.

Method of pumping a deep inaccessible drip.—R. M. Kellog, Mount Vernon, N. Y. Proceedings American Gas Institute. Vol. VI, part 2, page 135.

Special holder outlet.—R. Shacklette, manager Adrian Gas Company, Michigan. Proceedings Gas Institute Vol. IV, page 722.

Gas Used for Making Clay Pigeons

In the western part of Illinois is a plant owned and operated by a famous firearms and ammunition manufacturing concern in which clay pigeons are made and shipped to trap shots throughout the world. Gas from the mains of the Public Service Company of Northern Illinois constitutes the fuel in processes that turn out 10,000 an hour of these substitutes for live birds.

Experiments Towards Ridding Halifax Gas of Unusual Amount of Sulphur

E. R. Hamilton Outlines Difficulties, Economical and Otherwise, That Make Problem Especially Difficult

The large amount of organic sulphur in the gas produced from Nova Scotian coals has always presented a serious problem to gas manufacture in Halifax. To many consumers the sulphur in the gas has been so obnoxious that they have discontinued its use. The reputation thus established has badly handicapped the growth of the gas business, and until it can be overcome gas will never be a popular fuel in this city, declared E. R. Hamilton in a Canadian Gas Association paper. The only relief from this trouble has been in carefully venting all appliances. Past records show that the commercial gas, free of all hydrogen sulphide, has contained as high as 120 grains of sulphur per 100 cu. ft.

Chemical analyses indicate that the high volatile, good cooking coals of this province that are available in any dependable quantity are high in sulphur, the amount varying from 2.25 to 2.75 per cent. Analyses are generally lower in volatile, higher in ash, or do not make a satisfactory coke. Appended are a few recent analyses of maritime coals.

American Gas Coals Economically Impossible

American gas coals have been used in small amounts at different times in the past, but present prices and shipping conditions prohibit their use. Because of the growing shortage of American bituminous coals, no relief in the sulphur situation can be looked for from this source.

Several methods have been used for the removal of organic sulphur. Probably the oldest and best known is the use of lime. The chief difficulty with this process is its disposal after it is foul. It must be either thrown away or reburnt. The offensive odor of the sulphided lime or the sulphur dioxide from burning it is undesirable, especially if the gas plant is located near the center of the city. Lime purification was used in one of the old Halifax plants and some of the old employees still remember the disagreeable features of the process.

We recently experimented with lime on top of the oxide in one of our purifying boxes. Careful tests of the sulphur in the gas showed that the method was impractical unless we installed additional purifiers for the use of lime alone. The layer of lime which we could use was limited to about 6 in., as the rest of the space was needed for oxide. The effect was evident only for a few days, a maximum being reached three or four days after turning the box on and then falling off again in about the same length of time. The greatest reduction which we obtained was about 33 per cent, or from 75 to 50 grains per 100 cu. ft.

The use of aniline oil as proposed by Lomax in the 1908 "Proceedings" of the American Gas Institute was contemplated, but inquiry into the aniline oil market led us to believe that this system would be expensive to operate as well as uncertain as to the supply of oil. The method consists of adding aniline oil to a layer of spent oxide in the purifying

(*Continued on page* 204.)

American Gas Engineering Journal

SIXTY-FIRST YEAR

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As the Journal Views It

The Department Head as the Subordinate Views Him

There are a very large number of characteristics that the executive does not approve of when manifest in a subordinate.

By the same token there are a very large number of characteristics on the part of employers that employees do not view with approval.

Mr. H. M. Riley reveals a few of these in an article which is published elsewhere in this issue. It is published, however, not so much on account of the concrete defects in conduct it reveals as on account of the lines of thought it opens up.

Had we written Mr. Riley's article we would have written it much differently.

For instance, we would not have stressed so harshly on the managerial tendency to anecdote and reminiscence. Of course, this can be overdone.

But there is a wealth of value in the experience and history of a man who has gotten up; much that is instructive that an alert younger mind may seize upon and benefit thereby.

Mr. Riley's condemnation of the paternal attitude we more or less indorse, as we do his outburst against the admonition as to following the hands of the clock.

Assuming an attitude of disbelief in one's competence to judge with reason and common sense, to estimate values dispassionately and uninfluenced by momentary enthusiasm, merely because one is young is demoralizing to self-confidence, and self-confidence is a high essential to success and work ably done.

Hammering away on the punctual arrival and five o'clock departure implants too deeply into the weak-

ling mind the notion that honestly earning one's pay is a matter of hours. It is not! It is work done. All the hours of labor in history would have been useless had not something been done, something completed in that time.

Mr. Riley's article, we feel, is worth reading and the self-examination it should lead to.

Pressures and Gas-Range Lighters

The gas-range lighter is generally accepted as an improvement to the gas range vastly disproportionate to its size and cost.

Should electric cooking be so advanced as to lessen materially the margin of advantage that stands in favor of gas, the self-lighter will assume a considerably greater degree of importance.

When we hear irregularities of pressures discussed it is generally as it affects gas lighting. Yet in our own experience we have known of cases where gas-range lighters have been permanently shut off because irregularities in gas pressures were such that unless an unnecessarily large pilot be carried the flame of the lighter was subject to such frequent extinguishing—with consequent escape of unburned gas into the kitchen atmosphere—as to become a real nuisance.

Gas men in general are coming around to a realization of the paramount importance of close pressure regulation. But the way has apparently not been found in general practice to put what they know should be done into an actuality.

There should be greater haste toward progress in this direction ere we lose the advantage of modern improvements and adjuncts to appliances that their manufacturers are doing their utmost to supply us with.

Experiments Towards Ridding Halifax Gas of Unusual Amount of Sulphur

(*Continued from page* 202.)

boxes. The reaction between the oil and the carbon bisulphide is catalyzed by the free sulphur in the oxide, and while the oxide may be used over several times there appear to be no means for recovering the oil.

The reheating method used by Papst and Hall in Portland, Ore., and very carefully described in the 1910 "Proceedings" of the American Gas Institute, was next considered. Our laboratory experiments showed that we could expect excellent results from it. The chief drawback with this process is the fact that, like a water-gas plant, it requires the attention of a man to operate the generator and to change over the gas from one reheating chamber to the other. In a small plant the additional labor and equipment required runs the cost of purification up very high.

Carpenter's catalytic process, which has been in successful operation at the Old Kent Road and East Greenwich plants in London since 1913 and 1914, was seriously considered. The temperature required is only 850 deg. Fahr., as compared with 1,200 to 1,400 deg. Fahr. used in the Hall process, and the method is continuous. With the exception of shutting down occasionally to burn off the carbon deposited on the catalytic material there would be no other interruption. To avoid this a duplicate catalyzer is used. The process is economical of heat, as provision is made to transfer the heat in the outgoing gas to the incoming gas. The chief difficulty which prevented our adopting this system was the cost of the installation and the attention required in caring for the heating system, which would have to be independent of the rest of the gas plant. The patent rights to this process have recently been offered free to British companies, and while improvements are still being made upon it, its success is well established by seven years of actual operation at the London plants.

The Guillet process using iron oxide as a catalyzer has one advantage over the Carpenter process in that the temperature required is not as high, 400 deg. Fahr. being sufficient to promote the reaction. Steam or hot oil may be used for heating instead of the direct fire required by the other two systems just mentioned. This process was very seriously considered for Halifax; in fact, plans were drawn up for the installation. The proposed plant would have consisted of a well-insulated, cylindrical steel catalyzer filled with tiers of pipe coils through which hot oil was to be circulated, and also containing two trays filled with iron oxide lightened with non-combustible material such as granulated blast furnace slag; a heat interchanger for cooling the outgoing gas and transmitting that heat to the incoming gas, and an additional purifying box. It was proposed to use the Merrill Process hot-oil system for heating, as it is gas-fired and allows a very accurate regulation of the temperature.

Washing with Paraffine Oil

This process appeared more nearly self-operative than either of the other two heating methods. The chief difficulty presented was in the amount and expense of the equipment required, the lack of available space and the delay in getting the necessary material under present conditions. While plans for this last process were being made we were carrying on laboratory experiments to determine how much the sulphur compounds could be reduced by washing the gas with paraffine oil. The results were rather surprising, for it was found that a reduction of 75 or 80 per cent could be obtained if sufficient oil was used. Kerosene, straw oil, such as is used for toluol and benzol washing, and light lubricating oil were all found to be effective. A series of three small tower scrubbers were set up in the laboratory and the washing carried out on a little larger scale. The results here exceeded our expectations and it became pretty well established that if the oil could be successfully redistilled and the process made continuous this method would prove the quickest and best way out of our sulphur trouble.

We are equipped with a good by-product plant which, because of market conditions and the amount of raw material produced, has never been used. The dehydrating and dephlegmating column on the tar still, in conjunction with the still itself, offers a pos-

sible means of redistilling the oil, and the storage tanks originally designed for by-products will furnish storage capacity for the used and fresh oil.

Oil washing was tried out for one day by circulating oil through one of the ammonia tower scrubbers. A poor distribution of the oil took place because of the saturated condition of the coke in the scrubber, but sufficient data were obtained to indicate that a 50 per cent reduction in the sulphur compounds could easily be reached with a reasonably small amount of oil. A steam distillation of the oil in the dephlegmating column of the tar still demonstarted that the oil could be cleaned up and further laboratory tests with the small scrubbers showed no falling off in its absorption capacity.

The usual gravimetric or Referee's method of testing for sulphur was found to require too much time before the results of any changes in the process could be learned. It became evident early in the work that a shorter control method must be used. The modified Somerville method described in the U. S. Bureau of Standards' paper on the "Determination of Sulphur in Illuminating Gas" proved to be best adapted for our purposes. The products of combustion from a known amount of gas are drawn through iodine solution and the amount of iodine used up determined by titration with thiosulphate. Results agreeing within 1 or 2 per cent of the gravimetric can be obtained in a few minutes, as compared with several hours required by the old method.

The proposed installation of washers will be placed immediately after the purifying boxes. There will be three steel towers 4 ft. in diameter by 16 ft. high, filled with wooden grids and arranged in series. Fresh oil will enter the last scrubber and, overflowing from this, will be pumped over and over in the second and first scrubbers successively. For the pumping a battery of motor-driven gear pumps, each having a capacity of about 600 gal. an hour, will be used. The saturated oil from the first scrubber will overflow to a storage tank located near the still, and when sufficient has been accumulated it will be steam-distilled at a low temperature to remove the carbon bisulphide and then pumped to the fresh-oil tank to be recirculated. Laboratory results indicate that from 0.5 to 1.0 gal. per 1,000 cu. ft. of gas will reduce the sulphur over 50 per cent. With gas averaging between 60 and 70 grains per 100 cu. ft., this will bring us well within the old Dominion requirements.

A number of difficulties are foreseen. It is probable that there will be some loss of oil in the handling and distilling. As time goes on the oil may become so saturated with heavier oils from the gas that its absorption capacity will be seriously reduced. This will necessitate a complete redistillation by direct fire to leave the heavy products behind. A naphthalene sludge will probably form, but laboratory experiments with filtering have shown that this can be easily removed. Cold weather may make it difficult to pump the oil, but it is expected that by carefully covering the pipes this can be overcome. The absorption of the benzol and toluol from the gas and the resultant reduction in heating value offers another problem, but it is hoped to reduce this to a negligible amount by keeping the wash oil saturated with benzol and toluol, otherwise the distillate from the oil will have to be fractionated and the benzol and toluol returned to the gas.

Oil washing of gas is not new. During the war all the large gas plants were urged to undertake it for the recovery of benzol and toluol, but so far as is known it has not been used primarily for removing carbon bisulphide. If the laboratory results are borne out in practice the sulphur problem in Halifax will be solved.

Gas Works and Benzole

As a Substitute for Petrol, Benzole Has Been Proven Practicable and Economical—Extraction from Coal Gas Does Not Affect Lighting Qualities of the Gas—Methods of Extraction

By T. SINGTON

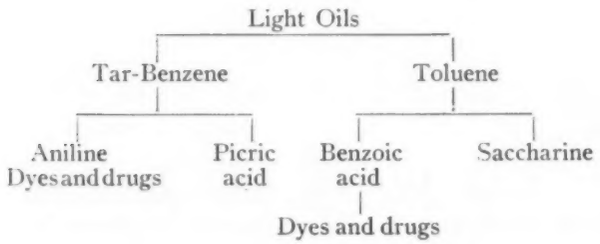
Gas works both in Great Britain and other European countries are one of the main sources of the supply of benzole, which is becoming a national necessity in constantly increasing quantities; all the more so as the world's demand for petroleum, now mainly supplied by the United States, threatens to exceed the world's output; even should the output be able to keep abreast of the demand, the supply of crude oil at the present rate of consumption is not expected by experts to last for more than two or three decades. It is important, therefore, that the gas works output of benzole should be increased to the utmost extent. The general public scarcely realizes the importance of benzole. As a motor fuel in place of petrol its value runs into millions. The scientific carbonization of coal will provide, when the petroleum supply shows signs of exhaustion, the world with a suitable substitute for motor traffic purposes.

Experience of recent years has conclusively shown that the extraction of benzole from coal gas is practical, economical and important. It is probable, that the demand exceeds the supply in spite of the fact that in addition to gas works, a large supply of benzole is obtained from coke-oven installations. It has been conclusively proved that with a well arranged up-to-date plant every ton of coal should yield at least 2½ gal. of benzole. Before the war the largest output of benzole in Europe took place in Germany; at the time of writing no recent German statistics are available, but the details as regards Great Britain, for last year, are as follows. They are probably typical of the output of most other countries, size for size:

	Tons	Gal.	
Coal carbonized in gas works	17,000,000	10,000,000	benzole
Coal carbonized in coke works	15,000,000	32,000,000	benzole

These figures show that the output from gas works (at least in Great Britain) is extremely small and could be very largely increased. Looking back a few years and comparing the former limited and crude carbonization of coal limited to the production of tar, with the present output of benzole, it must be noteworthy that few industries have experienced so radical a change of generally accepted practice as the coal-gas industry. Every nation is becoming more and more dependent for the indispensible supply of benzole upon gas works and on coke oven establishments, where there are any. By the carbonization of coal in gas works, light hydrocarbons are obtained, from which a great variety of by-products are obtained of great value, as shown in the following schedule:

COAL CARBONIZED YIELDS



Up to the time when Great Britain declared war, benzene, toluene and their derivatives obtained in gas works from the carbonization of coal were entirely limited to that section of these hydro-carbons derived from the tar practically the bulk of the very varied and valuable by-products, which were obtainable and are now so much sought for, were left in the gas and burned with it by the ordinary gas consumers, without, however, benefiting them in the slightest degree, as the extraction of these by-products leaves the illuminating gas for the production of which gas works are essentially erected, unaffected.

A similar wasteful system occurred in coke-oven installations, where the gas was, as it is technically called, "stripped" of its benzole and toluol by merely subjecting it to washing, an extremely crude process which merely absorbs these hydro-carbons, but leaves the other constituents to be wasted. The material generally used in this washing process is creosoted, the use of which increases the quantity of benzene obtainable from every ton of coal carbonized from 1.5 lb. to 10 lb. It is even possible to double the latter quantity, equal to approximately 2¼ gal. of spirit, containing something like 70 per cent of benzene. As regards Great Britain it has been computed that if all the gas works treated the whole of the coal used for benzene, the output per annum would be 35,000,000 gal.; if that were added to the quantity which could be obtained from British coke-oven installations, the total would exceed 96,000,000 gal. It was stated above that the quantity actually obtained was 42,000,000 gal., that enables us to form an idea of the waste continually occurring. Where gas works have no facilities to deal with by-products in the crude state obtained by distillation, they can be disposed of to works having appliances for its fractionation and rectification. On the average under normal conditions the quantity of the crude spirit obtained ranges from 3 to possibly 4 gal. per ton, but in addition to benzole and its homologues it contains a considerable quantity of naphthas. The percentage of benzole may reach, and possibly exceed, 40 to 50 per cent. The quantity of wash oil required, generally creosote, is about 60 gallons per ton of coal treated; but in some cases anthracene is substituted.

Benzole is admittedly well suited for the heavy motor wagons, now numbered by scores of thousands, found in every busy manufacturing and trading center. Their increase during the last few years has been phenomenal. Makers of benzole specially rectify it for the elimination of sulphur. It is equally useful during all seasons and at any temperature, as it cannot freeze. Moreover, it ensures an easy start. For the convenience of consumers it is obtainable in 50-gal. drums, or 350-gal. tank carts. As many readers know, benzole was subjected to an extremely severe test some months ago, to ascertain its adaptability as a motor spirit. The test confirmed all that had been claimed for it as a fuel and moreover settled the important doubt of the effect upon the engines using it.

Experts claim greater power in giving qualities for benzole over petrol. It is stated this advantage is well known to all motorists who have used both. The special object of the test was to ascertain the effect (if any), which benzole had upon the engine. It has now been established once for all, that it has no deleterious effect. The test was made as severe as possible. It extended over 60 days, along average roads of a length of 10,000 miles. After the test the engine was taken to pieces and critically examined, but no measurable wear was detected in any of the parts. Generally, it was found as the result of measurements of the frictional surfaces that the wear throughout was normal. There can be no reasonable doubt that benzole from coal is an excellent motor fuel and so far as known the only possible substitute for petrol when that runs short. Its use on the largest scale possible would tend to conserve petroleum, obviously a desirable object. It may be safely asserted of every country and all their gas works, that all benzole which can be produced has a ready market eager to buy it; but the world is yet a long way from carbonizing every ton of coal treated. It is only slowly moving towards a less wasteful use of coal, but those who are leading the way are earning a well-merited return by their appreciation of the commercial value of by-products.

It is, of course, essential for motor traffic purposes, that benzole should be obtainable wherever consumers require it. A well organized system of distribution is necessary. The quality of the benzole produced in gas works must of course be maintained at a constant and reliable level to enlist the confidence of consumers; if that can be assured the demand for benzole will continue to exceed the supply for a long time ahead. There is scarcely any visible limit to the demand, owing to the continual growth of motor transport. Many large gas works are well equipped with debenzolizing plants under expert control. The great point is, that under scientific management the carbonization of coal and extraction of the by-products does not impoverish the quality of the gas for lighting purposes.

The mode of production of benzole at gas works may be briefly summarized as follows: The coal is in the first instance broken into small pieces of a uniform size and washed with water to remove as far as possible all impurities. It is then conveyed to large ovens and subjected to a heat of about 1,800 deg. Fahr. As these ovens are closed to the outer air, the coal is reduced to an ash and great volumes of smoke, which is drawn by suction to the by-product reduction plant. This smoke is identical with that which escapes from every chimney large or small, from the largest factory to the smallest cottages. It contains all the by-products, including the tar, ammonia and benzole. The by-products recovery plant has to separate and recover these valuable materials. Tar is the first of them to be saved by condensation, for which purpose the smoke is cooled down until most of the tar becomes liquefied. Any tar remaining in the smoke is caught upon the wings of a revolving machine and whirled to the sides from which it trickles down into troughs from which it ultimately runs off to the tar tank. The second by-product saved is the ammonia, for which purpose water is required. The smoke fills circular towers about 30 feet high, from the tops of which fine sprays of water descend as a continuous rain, which catches and absorbs the am-

monia. As it falls to the bottom it is drawn off, treated with sulphuric acid, forming ammonium sulphate, for which there is a large demand as a manure. The smoke coming from the towers, now minus both the tar and ammonia is next treated with creosote oil, to remove the benzole, which has the same affinity for creosote that ammonia has for water. It follows that the process is the same: Showers or sprays of creosote oil falling on dense clouds of smoke within circular towers, the combined creosote and benzole fall to the bottom and are conveyed into stills, where the benzole is separated and afterwards refined for use as motor spirit, while the creosote oil is available to be used over and over again.

After the removal of this third by-product the originally black smoke has become colorless and forms the gas for lighting and heating purposes, to produce which is the essential purpose of gas works. It has been stated above that from every ton of coal approximately 2½ or more gal. of benzole are obtained. In addition there are 30 lb. of ammonium sulphate, 100 lb. of tar, leaving 12,000 to 15,000 cu. ft. of gas and 12 to 15 cwt. of coke. In the case of coke ovens these by-products are recovered in precisely the same manner, the only difference being that the coal is not first reduced to a smaller size and washed for the removal of impurities and the heat used is not as great. As a consequence a harder coke is produced suitable for iron and steel works.

How Should "New Business" Be Viewed Today

M. L. Kane Shows Situation as to Earning of Typical Company as Compared to 1914

I would call your attention to the relation of changed money values to "new business," declared M. L. Kane, manager gas department, Winnipeg Electric Railway Company, of Winnipeg, Man., in a paper before the Canadian Gas Association. I want to try and show you why new business is far more important to-day than it was three or four years ago, because of this change, and to lead you to see that we need study this condition which has arisen if we are to proceed intelligently upon an expansion of a new-business program.

The cry of to-day is that prices have gone up. In general this is true of the prices of all commodities or services which may be marketed readily, and which are not particularly established by long-term contrast or franchises, regulation or custom, but it is not true to any appreciable degree of values which are more or less fixed either by custom or governmental regulations. Consider for a moment what has actually occurred in the various money values with which the ordinary gas company is concerned. For convenience such values may be classified into three groups:

Group 1—Values of coal, labor, oil and other items entering into the operating expenses.

Group 2—Values of investment, including property such as land, building equipment, etc.

Group 3—Values received in return for gas sold as reflected by earnings.

What has happened to these various values?

Such as fall in Group 1 may be properly described as having gone rapidly upward. Coal and oil, the big factors, have doubled in price, and indications are that they will soon go higher. Even the supply of these materials at this time is causing considerable worry to the executives of gas companies. Labor, another factor which is so important, has soared over 100 per cent in most places.

How have the money values representing the investment changed? There are no doubt some who would argue that they have increased along with the money values of everything else. But however right such persons may be in their contentions, the fact remains that after considering all circumstances surrounding public utility investments, commissions and other bodies in whom power lies to adjust rates have as yet not given much weight to changes in values attributed clearly to the inflation of the dollar. For example, if a gas company's investment is found to have been $2,500,000 in 1914, regulating bodies for the most part would hold that this represents the value of the same property to-day, regardless of whether it could be reproduced for this amount. The consequence is that the investment value has remained practically unchanged.

In speaking of the third class of values, not much need be said. Gas rates have, as a rule, been increased, but not in proportion to the increase in prices of operation. The reason for this is that the machinery for adjusting rates works slowly, and also most commissions or powers have been reluctant to authorize increases which would produce more revenue than what appeared absolutely necessary to prevent the company from falling into the hands of a receivership. There are cases where this consideration has not even been given.

Having considered the various classes of values with which a gas company must deal to-day as compared with their places in 1914, let us proceed to consider them in relation to new business. Before doing this, however, permit me to digress briefly upon the relation of earnings and expenses.

Relation of Earnings and Expenses

The earnings of a gas company, which must be operated on a sound financial basis, must be sufficient to pay the "output expenses" and the fixed charges. I use the term "output expenses" to include all costs which would cease if the plant were shut down. This would include practically all wages, cost of coal, oil, materials for repairs, etc., all of which vary pretty much in proportion to sendout. "Fixed charges" as employed by me do not only cover the interest on bonds or bank obligations, but cover all costs which would continue even if the plant were shut down, such as property taxes, insurance, depreciation and reasonable dividends to shareholders.

Comparison of Yesterday's Plant and To-day's

Having finished the digression on the relation of earnings to expenses, as well as analyzed for you the various money values with which a gas company is concerned, let us, for the sake of illustration, consider a hypothetical plant as at 1914, assuming the following data:

Original cost as at Aug. 1, 1914..		$2,500,000
Bonds and other interest bearing 5 per cent.....	$1,200,000	
Capital stock (par value).....	1,000,000	
Surplus invested in the business	300,000	
Total liabilities		$2,500,000

Annual gas sales.....500,000,000 cu. ft.	
Average net rate per M. cu. ft.....	$1.20
"Output expenses" per M. cu. ft.....	0.80
Available for "fixed charges" per cubic foot....	0.40

From computations the following result would be found:

Annual gross earnings.....	$600,000.00
Output expenses	400,000.00
Available for fixed charges.....	$200,000.00

The interest requirements take $60,000 of this amount and depreciation charges, property taxes and insurance may be assumed to require another $60,000, leaving $80,000 for dividends on the return of the capital stock and invested surplus. In other words, dividends at 8 per cent might be declared.

Consider the probable financial condition of the same plant as of to-day. For the sake of simplifying matters, assume that its fixed assets and liabilities are the same and that the sale of gas remained constant, but its "output expenses" had increased 60 per cent and its rates changed from $1.20 to $1.55 net per thousand. Under these circumstances, what is its financial condition so far as ability to pay dividends? It will be found that the amount available is only $15,000 instead of $80,000. This is only 1½ per cent.

Gentlemen, you must consider these conditions before thing seriously of obtaining new money for "new business."

What relief must we look for to interest new capital for extension work? Is it to be increased rates? If so, you must immediately take steps to lay the matter before your cities and public bodies governing rates. To handicap your public utility seriously affects the advancement of your city and they must understand that new capital cannot hope to be attracted with no assurance of a reasonble return.

I would strongly urge that those of you who have the plant capacity should use every effort to increase gas sales if your output costs are somewhat less than your net rate, keeping in mind the fact that the return be sufficient to pay the interest on the added capital. Where new business means additional plant I can only refer you to our present situation.

There is a subject that I would like to call your attention to at this time. Are you operating your plant efficiently? It is well, gentlemen, to be sure of this before asking for relief from the public. I sincerely believe that every company, for its shareholders' protection, should favor a careful inspection of some reliable authority on efficiencies. Experience has shown in the past that at times gas companies have been reluctant to authorize modern improvements, however small, and have consequently allowed their operation to suffer. The source of this has been lack of executive knowledge.

NEW-BUSINESS DEPARTMENT

New business usually originates in your appliance department, and I think you will agree that it is the opinion of all that this department must be self-sustaining. It was the opinion of gas companies in former years to consider this department as a necessary expense for promoting the increased sale of gas, but I am sure this opinion has changed. We should make the sale price of our appliances cover all overhead expenses, connection charges and realize a reasonable profit. It is most necessry to retain the services of high-class men in order to obtain these results.

As to the probable trend of prices of appliances in the immediate future, conditions at present do not indicate any reduction and in all probability the costs will increase.

Special interest should be given to the efficiency of appliances, and it is to your interest to co-operate with the manufacturer. The most efficient appliance is the best advertisement our appliance department can have. For instance, some companies have found it necessary to insist upon lagged ovens, and it is interesting to know that recent tests show a 30 per cent saving in gas. This improvement might be used to compete against electric cooking, which is gradually becoming popular in certain locations.

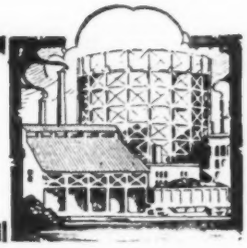
U. S. Bureau of Mines Opens New Experiment Station

Secretary of the Interior Payne, acting on the recommendations of Dr. F. G. Cottrell, Director of the Bureau of Mines, has selected Rolla, Mo., as the place for the latest mining experiment station of the bureau. This station will look after the mining interests of the Mississippi Valley and will give consideration to the various problems which are met with in the production of lead and zinc.

After a careful investigation, the Missouri School of Mines and Metallurgy at Rolla, Mo., was selected as an ideal place to carry on much of the actual laboratory and investigative work of the new station. However, it was also decided that the central offices of the station should be at or near St. Louis, Mo. Consequently, the plan is that the actual laboratory and investigative work shall be done in co-operation with the Missouri School of Mines and Metallurgy at Rolla, but that the headquarters of the station should be in St. Louis.

For a long time the Bureau of Mines has desired to take up, in co-operation with the mining and metallurgical industry, those problems met with in the Mississippi Valley where lead and zinc deposits occur. As is well known, the ores of this district are for the most part sulphide ores and are ordinarily not difficult to treat. However, there are also large deposits of oxidized lead ores in certain districts of Missouri, and their mining and metallurgical treatment presents a serious problem. Concentration by gravity methods had been tried for years on these ores, and there are many thousands of tons of high-grade tailings, as well as crude ore, awaiting proper methods of recovering metallic values. Such being the case, the bureau will carry on such research and investigational work in connection with the treatment of these ores as will assist in the development of processes which will prevent their being wasted, due to the lack of a metallurgical process which it may be commercially feasible to apply to them.

NEWS OF THE GAS INDUSTRY



Brooklyn Gas Company Wins Land Suit

Justice Callaghan in the Supreme Court, Brooklyn, N. Y., decided in favor of the Brooklyn Union Gas Company, in the suit of the State to restrain the company from carrying out the terms of sale of waterfront property to the Brooklyn Edison Company. The State sought to oust the gas company from the property on the ground that it had no title to it. Justice Callaghan also decided in favor of the gas company in its suit for $1,000,000 for damages for alleged breach of contract against the Brooklyn Edison Company.

The Edison Company, it was said, had refused to carry out the terms of the contract, asserting the gas company had no title to the property. The two cases were tried some time ago before Justice Callaghan.

Justice Callaghan points out that the company had been in possession of the property for more than fifty years, and that the law presumes that an action must be started within forty years. He pointed out that the company had occupied the land and paid taxes on it.

In his decision Justice Callaghan says:

"I can see no escape from the proposition that the gas company has a fee title to all the filled in land below the original low water line. By the act of 1857 a bulkhead line was established and the owners of the upland were authorized to fill in and thus extend the upland to the point found by that act. Besides, there was authority from the State by various other acts of the Legislature establishing bulkhead lines and thus permitting the upland owners to fill in the land under water.

"These statutes have been construed by the Court of Appeals with the result that the upland owners have been adjudged to be the owners of the filled in land. It seems that the State by grants from the land board made pursuant to statute, has granted a good title to these lands.

"While it may be that the parties to whom these grants were made do not hold the record title to the land then immediately adjoining the water, the State was charged with knowledge of that fact and by making grants aquiesced in the claim of the applicant (the gas company) as the ownership of that land.

"Such a grant vests title in the upland owner. At any rate the grants cannot be attacked collaterally, and as the State has allowed to stand for more than fifty years the regularity should be presumed.

"But, aside from every other consideration, the State should be precluded from maintaining this action."

First Gas Plant on Catalina Island Completed

The shortage of gasoline now or in the future has lost its terror for Avalon, Cal. It was not for locomotion that the island city depended on gasoline for the past thirty years—but for the cooking of meals.

But that day is now no more for the municipal gas plant has been completed and is now in operation. The island city celebrated the great event with a musical program and dance around a blazing torch.

Mayor P. V. Reyes of Avalon rose at 4.30 in the morning to watch Mrs. Reyes prepare his breakfast over the clear blue flame.

"Gas is one of the greatest assets to Avalon," said the mayor as he watched his wife smilingly turn off the flame after the first meal cooked over gas at Catalina.

The new city gas plant cost approximately $90,000.

Gas Struck at Circleville, Pa.

Gas has been struck at the Hempfield Gas & Oil Company's well No. 1, near Circleville, Pa. It is said that the gas is almost odorless, and for this reason the presence of it was not observed at first and in a minute it was ignited.

The pressure is very strong and the volume of gas is abundant. The driller did not expect to find gas in large quantity at the distance of 1,500 ft. It was with difficulty that the flow of gas was tapped and the flame extinguished.

Nominations for Officers and Directors for 1920-1921 of A. G. A.

In accordance with the by-laws of the American Gas Association the Nominating Committee, consisting of Charles N. Nettleton, chairman, and Messrs. Jansen Haines, L. B. Young, John Gribbel, F. H. Farnshaw and A. F. Staniford, duly appointed by the executive session of the association on Oct. 14, 1919, have submitted the following recommendations for officers for the ensuing year, eight directors for two-year term and one director to fill unexpired term for one year.

OFFICERS

For president—Charles A. Munroe, Chicago, Ill.
For vice-president—Howard Bruce, Baltimore, Md.
For treasurer—H. H. Brundage, New York, N. Y.

DIRECTORS TO SERVE TWO YEARS

Samuel T. Bodine—Philadelphia, Pa.
Henry L. Doherty—New York, N. Y.
Thomas N. McCarter—Newark, N. J.
Emerson McMillin, New York, N. Y.
George D. Roper—Rockford, Ill.
W. G. Gribbel—Philadelphia, Pa.
R. C. Congdon—Atlanta, Ga.
L. R. Dutton—Jenkintown, Pa.

DIRECTOR TO SERVE ONE YEAR

F. H. Knapp—Pittsburgh, Pa.
(To fill unexpired term of Howard Bruce, nominated for vice-president.)

These nominations will be presented for election at the November convention.

N. Y. Consolidated Enlarging Astoria Plant

New York has the largest gas plant in the world, that of the Consolidated Gas Company at Astoria, but it was found two or three years ago that this was insufficient to meet the needs of the two boroughs, Manhattan and the Bronx. Plans were made for a fourth unit as an auxiliary to the other three, and this unit, which is to be completed by Dec. 1 next, will have a capacity of 30,000,000 cu. ft. daily. The present plant has a capacity of 50,000,000 cu. ft. every twenty-four hours. The fourth unit adds 60 per cent to that total.

The company is also to start soon at building another holder with the same capacity as the present one, 15,000,000 cu. ft., to be completed in 1922.

The new unit, which is for the manufacture of water gas, consists of a gas generator house 367 ft. in length, 87 ft. in width and 70 ft. in height; a tar extractor or condenser house 40 ft. by 60 ft.; boiler house 90 ft. by 50 ft.; engine house, scrubbing houses and other smaller buildings necessary for the complete process of the manufacture of gas. The final product, gas ready for consumption, is conveyed through a tunnel with a diameter of 25 ft. and over a mile in length, going under the East River to a big holder in the Bronx, whence it is distributed to all parts of the Bronx and Manhattan.

The company has two units equally as large as the above described for making gas from the tar extracted from coal and one other for the production of water gas.

The company uses 1,125,000 tons of coal per year, and as the price of this commodity delivered to the plant has advanced from $3 per ton to $12 per ton, the company's fuel bill has advanced from $3,375,000 to $13,500,000 per year. The company has been able to get but a small supply and has less reserve on hand than ever before at this season of the year. Labor has advanced 150 per cent. The cost of construction of the new building is double what it was before the war.

Company officials say that the quality of the gas is fully up to the standard of the past. The company maintains a chief chemist constantly at work studying better and more economical methods of manufacture and for the utilization of by-products and the testing of materials. It has a high-class laboratory.

The company has been trying to have the standard of gas measurement changed from the candle-power unit to the B.t.u. standard. ist and twenty assistant chemists Better results can be obtained with the Welsbach burner under thermal system than under the candle-power method. This system is used in twelve or fifteen States and in all of New York State outside New York City.

The use of gas for industrial purposes is constantly on the increase, and this more than makes up for the loss resulting from the falling off of the use of gas for lighting purposes due to the use of electricity. Its use for kitchen purposes is also largely increasing. The company is constantly investigating as to new methods for the use of gas for industrial and household purposes.

The company supplied the Government with over a million and a half gallons of toluol, used in making the high explosive shells, and five million gas masks during the war. About all of these supplies for use abroad were made directly by the company or from material furnished by the company.

Fort Wayne Construction Co. Enlarges Plant

The Western Gas Construction Company, of Fort Wayne, Ind., which has enjoyed a wonderful growth of business during the past year, has found it necessary to enlarge its plant. Accordingly, a new building has been erected on Buchanan Street for the drawing department, of which the accompanying cut is an interior view. The order department, planning and art departments are also included, with plenty of space left for the holding of conferences relative to engineering subjects.

The location is a most advantageous one, immediately opposite the main office, with plenty of light and air for this room, which is the last word in equipment. This will help solve the question of securing good men, as there is ample room for more tables. This new equipment was decided on to expedite the erection of a complete gas plant in Chicago, with a capacity of 20,000,000 cu. ft. per day. The contract for the work was awarded the Fort Wayne concern and is already under way. The men in the drawing room find their work very interesting and are frequently called on to assist in engineering and sales work out of the city.

DRAWING DEPARTMENT OF WESTERN GAS CONSTRUCTION COMPANY

Closing of Plant by President Whitney Leaves Brainerd Without Gas

Brainerd, Minn., has no gas plant functioning and seems in a fair way to lose the plant, according to the statement made by President A. G. Whitney of the Brainerd Gas & Electric Company at a recent meeting of city council, gas company held at the court house.

Mr. Whitney recited the losses claimed to have been sustained by the company by rising costs of coal, coke, oil, in fact everything that entered into the making and selling of gas.

Mr. Whitney gave figures on costs of gas for various months of this year, the bare cost and then the cost plus depreciation and interest charges, and both largely exceeded the rate charged in Brainerd, which with discounts amounts to $1.60. For instance, said he, gas costs the company $2.10 a thousand in the month of January, and $3.288 when allowing for depreciation and interest. In May cost of gas was $3.36 and plus interest and depreciation $4.15.

Up to April 30, as he said his books showed, the company had lost over $42,000 in operating its Brainerd plant.

"Our losses have been such that we cannot continue," said Mr. Whitney.

He said he had come to Brainerd to ask for an increase to $3 a thousand, and that rate would have to be one varying according to coal, coke, etc., prices, raising as these advanced and lowering as they decreased.

Then came the accident at the plant when the compressor and other valuable machinery were wrecked. The loss was estimated at $6,000.

R. L. Spiering, a gas engineer employed by the Whitney public utilities arrived from Crookston and examined the plant as well as he could and estimated the damage at $8,000. Mr. Spiering, when interviewed later, said the damage to the plant included loss of all instruments to test gas pressure gauges, damage to compressor, etc.

"The only thing left to do is to close the plant," said Mr. Whitney. "We do not think you would grant us an increase large enough to continue. The company could not raise $8,000 on our record of losses, unless I advanced it myself, and that I did not care to do under present conditions."

The company has approximately 705 consumers and the gross earnings during the summer months are running about $2,500 per month, or about $3.50 for each meter. A number of our consumers only pay the minimum bill. The plant started Aug 28, 1916. The total amount charged to depreciation during the entire period to December 31, 1919, was $13,200, and the only interest charged was on the actual indebtedness, and no interest returns have ever been charged on the rest of the capital investment. That no charges have ever been made for Mr. Whitney's services or that of his St. Cloud assistants; that for the last two years the bookkeeping department at St. Cloud has been paid $40 per month for keeping the books and prior to that time $30 per month. Hence no one can say but what the expenses are less than they actually should be. That the cost as shown by the books of the company for making gas for the month of Jan., 1920, was $2.10 per thousand cu. ft.; with a proper charge for interest and depreciation on the money actually invested the rate should have been $3.28 to break even.

Mr. Whitney, before leaving Brainerd, made the following proposition:

That the gas plant could be started up at the following rates: Minimum bill $3 per month with a rate of $3.25 per thousand ft. of gas, these rates being subject to an increase or decrease according to the cost of coal, coke and oil.

It is believed that this price will take care of all operating expenses and the interest on the investment without any provision for depreciation. The $3.25 rate, however, would be continued after the commodity prices had been lowered until the depreciation fund has been provided for on a basis of 7½ per cent of the cost of the plant per annum.

It is also further provided that the citizens of Brainerd take $25,000 worth of stock of the Brainerd Gas & Electric Company.

If the offer is not accepted it is Mr. Whitney's intention to dismantle and sell the plant.

Granted Increased Rates

Authority to increase the rates for gas service in Taylorville, Pana and Beardstown, Ill., by the Central Public Service Company, has been granted by the State Public Utilities Commission.

Bronx Granted $1 Gas Pending Court Action

The Central Union, Standard Union and Northern Union Gas Company of the Bronx, N. Y., have been authorized by the Federal courts to increase the rate of gas in the West Bronx from 80 cents to $1, pending the determination of their applications for a permanent increase in rate.

When these three companies secured the temporary injunction the Court fixed the rate. The corporation counsel contends the court is without power to fix a rate, and no one except the State Legislature or an agency created by it, is vested with the authority to increase the rate beyond the maximum 80 cents fixed by the law of 1906.

In granting the Consolidated Gas Company a temporary injunction pending the determination of its application for an increased rate, the Federal court increased the rate to $1.20 per thousand cubic feet in Manhattan.

It was the fixing of this rate for Manhattan that led many residents of the Bronx to believe that the $1.20 per thousand cubic feet rate applied to this borough because the companies serving this section are subsidiary organizations of the Consolidated Gas Company.

Abraham Gilbert, appointed by Justice Meyer as a special master to determine the merits of the application of the three Bronx gas companies will set a date for trial, which in all likelihood will be during the first week of October.

Blackstone Valley Gas & Electric Report

The Blackstone Valley Gas & Electric Company, Pawtucket, R. I., reports gross earnings for the 12 months ending June 30, 1920, of $3,018,777, an increase of $491,055 over the total for the previous 12 months, $2,527,722. Net earnings for the year were $923,873, an increase of $287,738 over the previous year's figures, and the surplus after charges is put down at $625,315, in comparison with $345,212 for the previous year, a gain of $280,103.

Gross earnings for June increased $69,605 over June, 1919, totaling $271,326. The net earnings for the month were $67,885, an increase of $26,991 over June, 1919; and the surplus after charges for the month was $42,952, against $15,774 in June, 1919, a gain of $27,178.

Dallas Gas Dispute to Be Mediated by Chamber of Commerce

A new avenue for a settlement of the dispute between the Lone Star and Dallas Gas Companies over the question of supply facilities has been opened by the Dallas Chamber of Commerce with a communication sent to each of the contending factions. The communication suggested a settlement by a committee of business men on the basis of total population.

The Chamber of Commerce would effect a settlement of supply facility apportionment upon a compromise basis, that of total population of the localities served from the feed lines. The Lone Star has contended for a settlement upon the basis of official population of the cities, while the Dallas Gas Company desires the settlement to be upon the basis of the number of meters in use. The total population basis has also been recommended by Ed C. Connor, engineer for the Supervisor of Public Utilities.

After going fully into the question of a fair apportionment of the supply facilities between Dallas and Fort Worth Mr. Connor declares as his conclusion, "In order that the now existing ratio, which appears to be fair and equitable, be maintained, there must be added to the feed line capacity serving Dallas a line that will deliver approximately 10,000,000 cu. ft. per twenty-four hours."

Basing his calculations upon the area capacities and the lengths of the supply lines serving the two cities from the producing company's measuring stations outside of the two cities, he figures that at the present time the facilities are fairly apportioned but that Fort Worth will be given the advantage with the completion of a new feed line, which will increase the supply facilities to that city by 6,450,000 cu. ft. per twenty-four hours.

Not only Dallas proper, but the towns of Arlington, Grand Prairie and Dalworth supplied by the Dallas County Gas Company, are included by the engineer in his comparison for the reason that these towns are supplied from the same feed lines as are the city. The entire metropolitan district of Dallas is supplied through a measuring station located near Irving, seven miles from the city limits, while the measuring station through which Fort Worth is supplied is only three miles from the limits of that city. The pressure of the gas can be regulated at the measuring station and assuming that it is supplied to both cities at the same pressure the nearness of the station for that city gives it an added advantage over Dallas.

A comparative analysis of the factors entering into the dispute as worked out on a percentage basis by Mr. Connor shows that the domestic consumption for Dallas is 60.8 per cent to 39.2 per cent for Fort Worth; in the number of meters Dallas has 63 per cent to Fort Worth 37 per cent; of the feed line delivery capacities Dallas is afforded 59.9 while at present Fort Worth has 40.1, while the population basis of 1910 compares 56.5 for Dallas to 43.5 to Fort Worth.

It also shows that the number of meters is comparatively greater in the city of Dallas and the consumption per meter is less in Dallas than in Fort Worth.

Marked Increase in Use of Gas for Heating and Cooking in Washington

Washington, D. C., in a few years will use gas for heating and cooking almost exclusively, in the opinion of Howard S. Reeside, president of the Washington Gas Light Company.

Reeside bases his opinion on the fact that the use of gas in Washington has increased twofold over the pre-war consumption and that many of the homes now being erected are designed to be heated by gas.

Another fact that leads Reeside to believe gas is the coming fuel, is that coal prices are higher every year, while gas will cost not much more than coal does now, with the added attraction that gas causes no dirt, ashes or shoveling.

If the consumption of gas increases, additions will have to be built to the present local plant, as it is now running to capacity. He also predicted, in a few years, more general manufacture of coal gas instead of oil gas now made in the majority of plants in this country.

When gas companies began using oil some years ago, it could be bought for approximately 2 cents a gallon. Now the price is 15 cents a gallon, and the oil is of poorer quality. This is due to new processes of refining, whereby more gasoline is taken out of the oil.

Oil refiners would like to cease supplying gas companies, it is said, but fear a shut down of the gas industry would result should they refuse to sell oil.

The oil supply of the country is growing lower each day, and it will only be a short time, Bureau of Mines officials say, when gas companies will be forced to give up the use of oils and turn to coal.

In nearly every city in the United States, the principal use of gas is for heating and cooking. It formerly was the principal lighting agent of many cities, but electricity, with its many improvements, largely has displaced gas as an illuminant.

The quality of gas is no longer measured by candlepower, save in a few cities. The present standard is the British thermal unit (B.t.u.). The District of Columbia requires that gas furnished here contain 600 B.t.u. The gas company contends that gas containing 500 B.t.u. is of good quality, and that even a lower grade would be acceptable, with some minor adjustments to present appliances.

The Washington Gas Light Company, in order to produce enough coal gas to supply Washington, would require more than 400,000 tons of fuel a year. This, it is contended, would furnish transportation difficulties for railroads entering the city.

The company's plant is now equipped to make coal gas. The company owns Analostian Island, in the Potomac, where it intends to erect a modern plant as soon as the money market is easier, and interest rates drop, and the cost of building becomes cheaper. Company officials contend it would be folly to borrow money at 10 or 11 per cent to erect a plant, when the Utilities Commission allows them only 6 per cent return on their investment.

When the new plant is built, it probably will be equipped to manufacture gas from coal.

Niles Gas Light Co. Granted Second Rate Increase

At a special meeting of the Common Council of the city of Niles, Mich., held on Aug. 31, the Niles Gas Light Company was granted an increase of rate from $1.25 per thousand to $2 per thousand. This is the second raise in rate granted the Niles company. On April 1, 1918, the rate was raised from 95 cents, which was the rate allowed by franchise, to $1.25 per thousand.

The work of installing two new benches is about completed.